1. Scope

1.1 This procedure covers inspection of gear tooth surface hardness with portable hardness testers.

2. Referenced Documents

2.1 ASTM E110 Standard Test Method for Indentation Hardness of Metallic Materials by Portable Hardness Testers.

2.2 ASTM A956 Standard Test Method for Equotip Hardness Testing of Steel Products.

3. Terminology

3.1 Surface hardness-

4. Significance and Use

4.1 Application-

5. Apparatus

5.1 Hardness tester- Either a Microdur or an Equotip hardness tester shall be used.

5.2 Hardness test block- A test block certified to 58 HRC hardness and traceable to NIST shall be used.

6. Test Specimens

6.1 Gears- Hardness tests shall be performed on gear teeth after all grinding is completed.

7. Procedure

7.1 Readout Scale- Readout shall be displayed in Rockwell C (HRC) units.

7.2 Verification- The accuracy and repeatability of the hardness tester shall be verified before and after any series of hardness measurements are made. At each verification, five tests shall be taken on the hardness test block. The average reading shall be within the limits of 57.5 and 58.5 HRC. The range of readings shall be within 57 and 59 HRC.

7.3 Calibration- The hardness tester shall be adjusted to maintain accuracy and repeatability within limits for average and range of readings specified in 7.2 Verification.

8. Interpretation of Results

8.1 Rounding- Readings shall be rounded to nearest integer. For example, a reading of 57.5 shall be reported as 58 HRC and a reading of 57.4 shall be reported as 57 HRC.

9. Acceptance Criteria

9.1 Minimum Hardness- Minimum hardness shall be 58 HRC. If any reading is less than 58 HRC, three additional readings shall be taken within 3 mm of the low reading. The average of the three additional readings shall be 58 HRC minimum after rounding per 8.1 Rounding. Otherwise, the gear is rejectable.

9.2 Maximum Hardness- Maximum hardness shall be in accordance with drawing specification.

10. Report

10.1 The report shall include the following:

10.1.1 Description of the hardness test machine.

10.1.2 Minimum surface hardness.

10.1.3 Maximum surface hardness.

10.1.4 Records of calibrations